



NORTH CAROLINA

Department of Transportation



NCDOT UAS Integration

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Division of Aviation

October 23, 2018



UAS Program Office Role



Regulatory

Permitting commercial N.C. UAS operators



Education

Safety, opportunity



Research

Technology benefiting state



Flight Services

NCDOT, other state agencies, local governments



Government Agency Integration

UAS program development and support



NCDOT Utilization

- **Division 1** (2) – Project monitoring and inspection, storm assessment
- **Division 8** (1) – Project monitoring and inspection
- **Division of Aviation** (10) research, training, airport inspections, operations for other units
- **Communications** (2) capture video and photographs of NCDOT events and projects throughout the state.
- **Photogrammetry** (1) focused on developing photogrammetry standards for UAS.
- **Roadside Environmental** (1) photograph jobsite erosion control measures and document the wildflower program.
- **Geotechnical Unit** (1) respond to landslides in the western part of the state.
- **Environmental Analysis Unit** (2) apply herbicide to invasive species on the coast.
- **Safety & Risk Management** (1) safety assessment of construction sites.

NCDOT UAS Fleet



DJI Inspire 2



Yuneec Q500



DJI Phantom 4



sensFly eBee



DJI Matrice 200



DJI Matrice 210

Construction Site Monitoring

- Project Documentation
- Project Inspection/Monitoring
 - Erosion Control Measures
 - Bridge Pours
 - Traffic Control
- Photos and Videos uploaded to cloud (OneDrive or Sharepoint)



Division 1 – Storm Damage Assessments



NCDOT UAS Integration

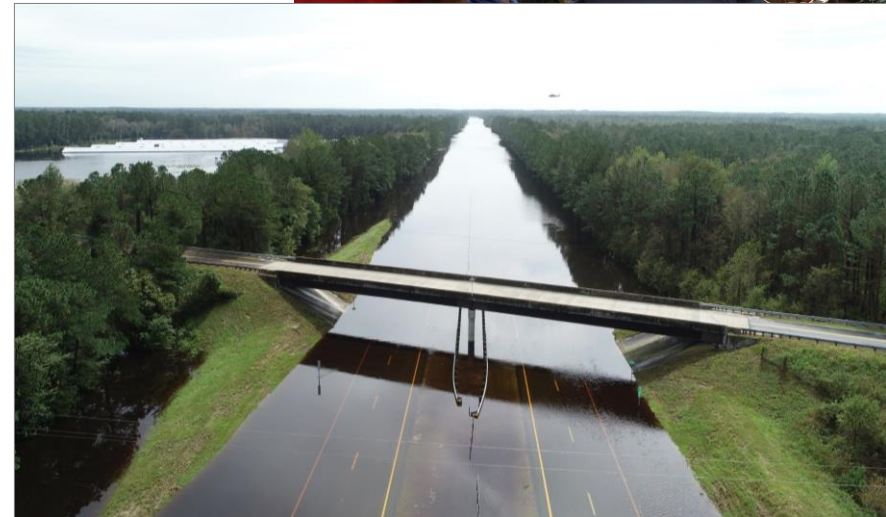
- UAS Working Group
- Department UAS Policy
- Training and Certification
- Platform Selection
- Recurrent Flight Training
- Additional Waivers and Authorizations
- Fleet Management
- Coordinated Emergency Response
- Maintenance and Repair
- Contracted Services
- [To keep updated, click here](#)



Role of Division of Aviation:
Facilitate the safe integration
of drones within the
Department

Hurricane Florence Response

- NCDOT Led 15 UAS Teams
- Over 250 missions flown
- Over 8,000 videos/photos uploaded to statewide map
- Over 45 live streaming events
- >515 Gigabytes of Video and Photo taken
- Coordinated response with zero incidents



NCDOT UAS Response Video



<https://vimeo.com/ncdotuas/review/295899126/65d2f5591b>

[Home](#)[News](#)[Weather](#)[Investigations](#)[Entertainment](#)[News](#)[Better Get Baquero](#)[Late Night](#)[New York Live](#)[Open House](#)

This Isn't a River, It's a Highway

Interstate 40 is looking more like a river than a road. The North Carolina Department of Transportation published this drone video captured Monday of Interstate 40, as part of... [See More](#)

US 421 into Wilmington



on 9/20/18

on 9/21/18



US 421 into Wilmington on 9/21/18



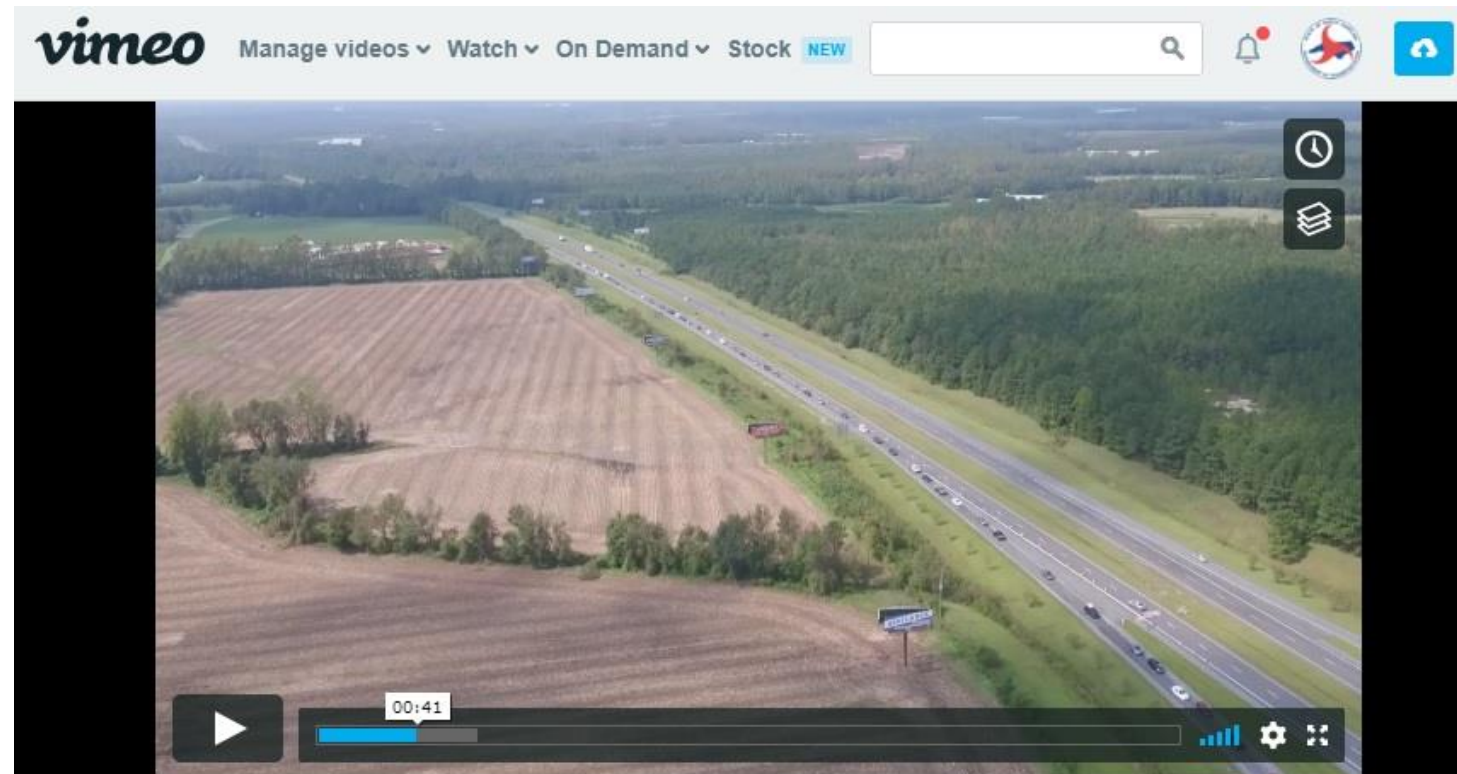
US 421 - Monitoring



US 70 & US 258 in Kinston on 9-21-18



Live Streaming Video for Traffic Management



🔒 **Wilmington Detour I-40**
Exit 373 LIVE NOT YET RATED

See all video stats
Only visible to you

[View Stats](#)

UAS Mission Workflow/Process



NCDOT
Divisions /
Business Units

Form

smartsheet

Hurricane Florence Airport Status

Please provide status updates for your airport. This information is critical and is used for many purposes at the Emergency Operations Center prior to, during, and post storm. Please update this form as your situation changes due to closures, fuel supply changes, etc. Please fill in the form out in its entirety.

Airport*
Select airport from the dropdown list.

Back to Normal Operations (Post Florence)*
Select Yes only if your airport is back to Pre-Hurricane Florence conditions (All Runways Open, Not Running on Generators, No NOTAMS issued due to hurricane, etc.)

If you submit yes here, you do not need to re-submit a form unless unforeseen flooding has occurred.
Yes No

Are you commercial service?
Check for yes.

Person Submitting Form
Please provide the name of the person updating the data.

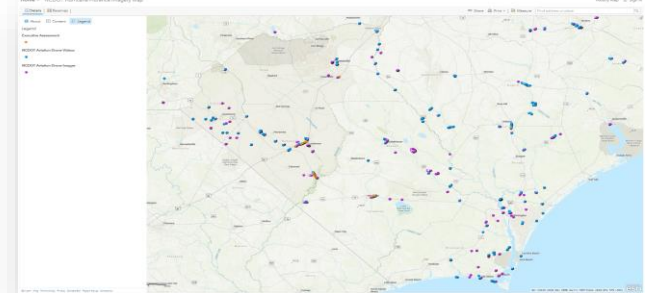
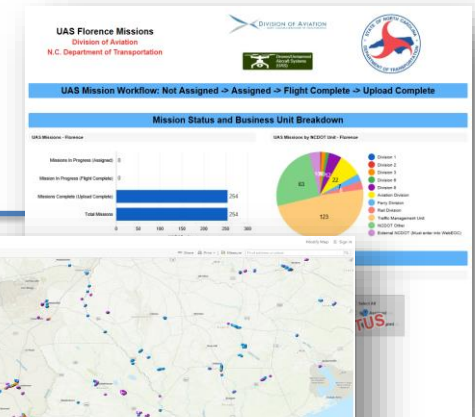
Best Contact
Please provide your best contact method (i.e. Phone number, email address, or both).

General Airport Status
Is your runway open for use?
Check for yes.



Stakeholders

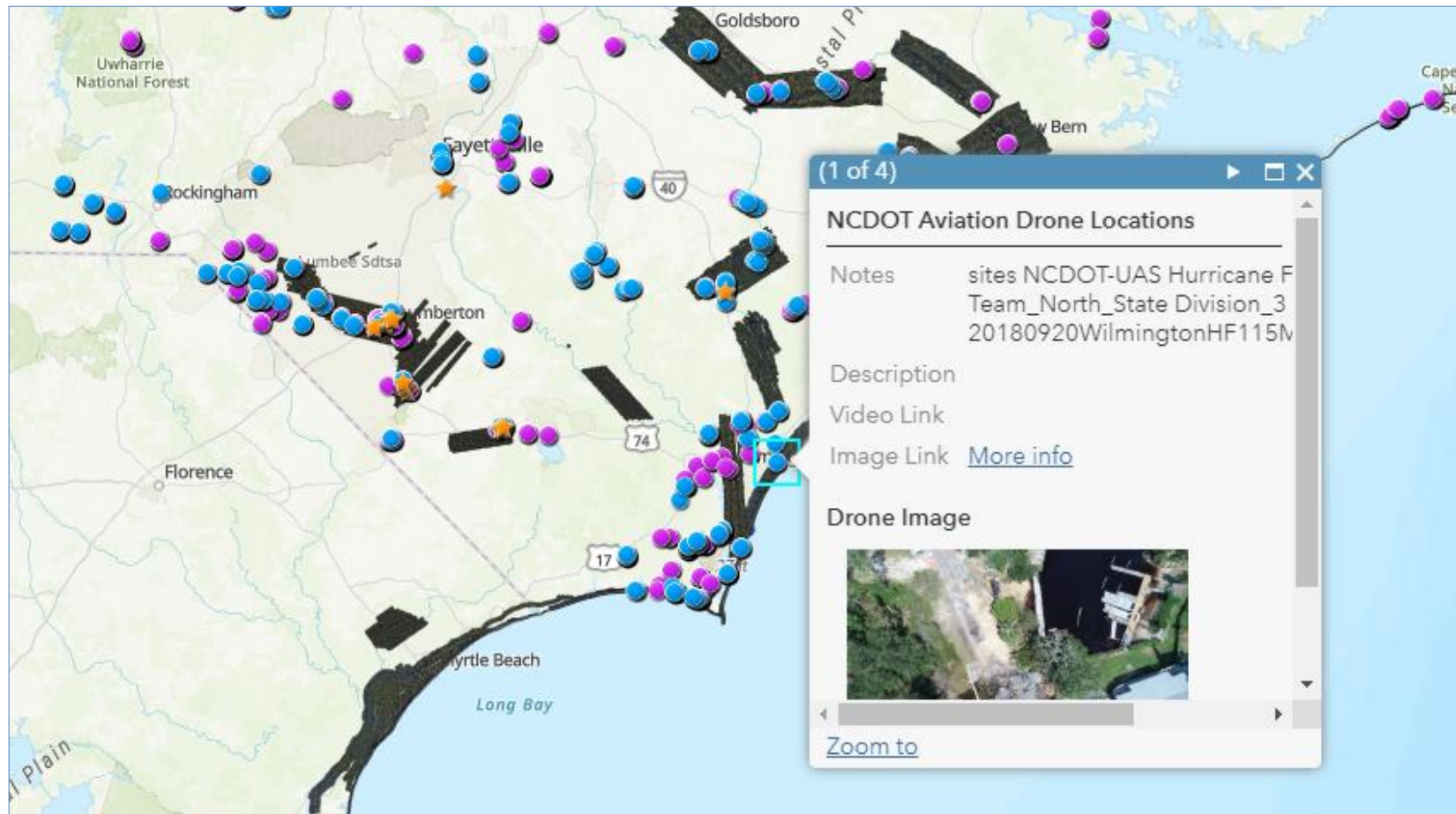
Dashboard,
Content Retrieval



Mission Request ID	Complete_Flag	Mission Objective	Requesting Division/Unit	Contact Name	Contact Email	Mission Location (Div-County-City/Name)	Mission Location (Latitude/Longitude)
HF187	Upload Complete	Road closure location (Teal Hill Road)	Aviation Division	n/a	n/a	10-004-Anson	
HF188	Upload Complete	Road closure due to flooding/washed out	Aviation Division	n/a	n/a	10-004-Anson	
HF271	Upload Complete	Look into traffic situation at US17 and NC43 in Vanceboro. Livestream if possible.	Aviation Division	Internal	Internal	2-028-Craven	
HF203	Upload Complete	East Charlie captured East Bolling Spring Rd next to Lake					
HF202	Upload Complete	Red Charlie flew East Bolling Spring Rd next to Pine					
HF254	Upload Complete	Drone fly-over to Duke Energy Sutton Plant (1671) At Basin, 1694 Ash Basin, and Sutton Lake during post conditions on Saturday, September 22, 2018. Object take photos and videos of the affected area.					
HF189	Upload Complete	Hammock Beach road flood area					
HF272	Upload Complete	Observe traffic and road conditions on US 17 through Hamstead. Livestream if possible.					
HF236	Upload Complete	Flooded Road					
HF145	Upload Complete	Take photo and videos of AC2 Henderson Field. To: base with FBC Red and let them know you are there behalf of the NCDOT Division of Aviation.					
HF171	Upload Complete	Record conditions on NC 53 in Kelly. Photos and vid Livestream if possible.					
HF275	Upload Complete	Check on conditions on NC 53 just East of Kelly and record pictures and video. Livestream if possible.					
HF274	Upload Complete	Take pictures/video of road conditions on 210 below near Kelly. Livestream if possible.					
HF273	Upload Complete	Capture photos/video of road conditions on NC-73 at Kelly, NC.					
HF288	Upload Complete						

Reports, Mapping

Interactive Real Time Data



FAA UAS Integration Pilot Program



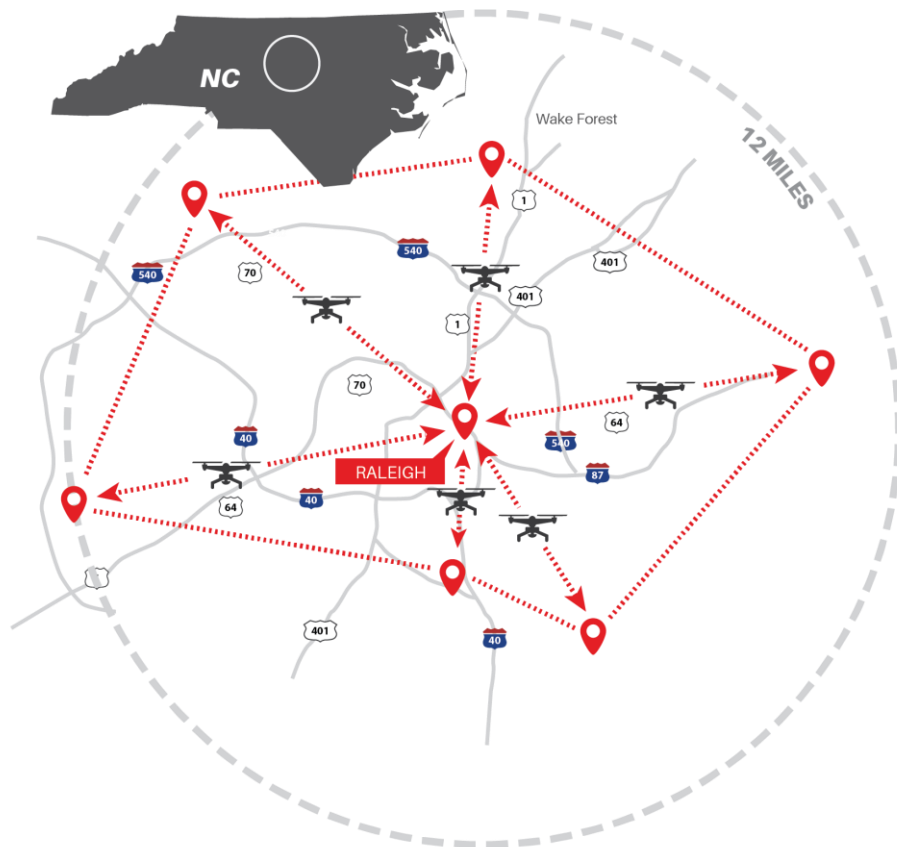
North Carolina Participation Goals



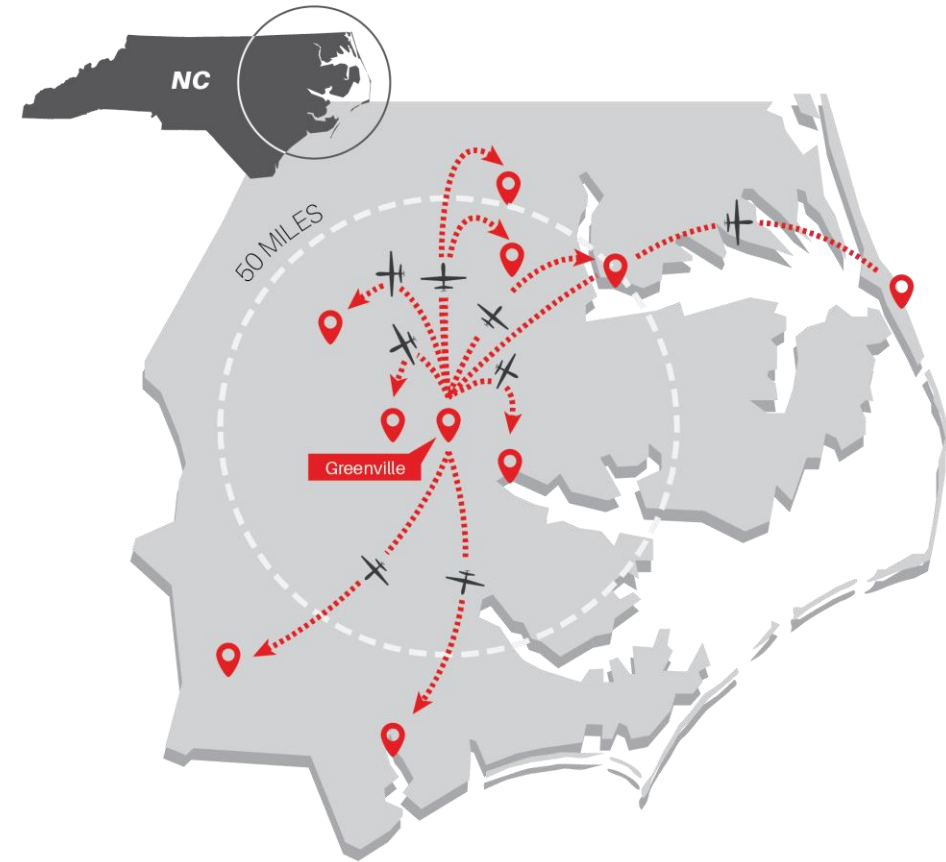
- **IMPROVE** the lives and economic well-being of North Carolinians through innovative UAS operational concepts throughout the state, with primary focus on **medical package delivery**
- **UNDERSTAND** the role of state and local government in localized UAS airspace management and new regulations
- **INFORM** development of federal guidelines and regulatory decisions on UAS operations nationwide
- **ENABLE** gateway to routine UAS operations for the public good

Planned NC Operations

Urban Example



Rural Example



First Flight: Medical Package Delivery

Matternet at Wake Med | Aug. 29, 2018

**Task:**

Fly a lab sample from a medical surgical center to main WakeMed campus

Test:

- Package delivery
- Remote ID
- Air space management tool
- Flight over people

Next Flight: Oct. 2018

- Food delivery
- Suburban community
- 3-mile radius

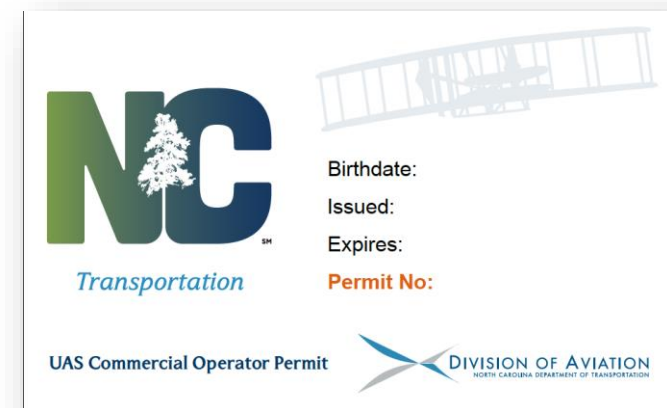
UAS Operator Permits

Federal

- Pass a UAS knowledge test at FAA testing center and TSA background check
- Apply for Remote Pilot Certificate

North Carolina

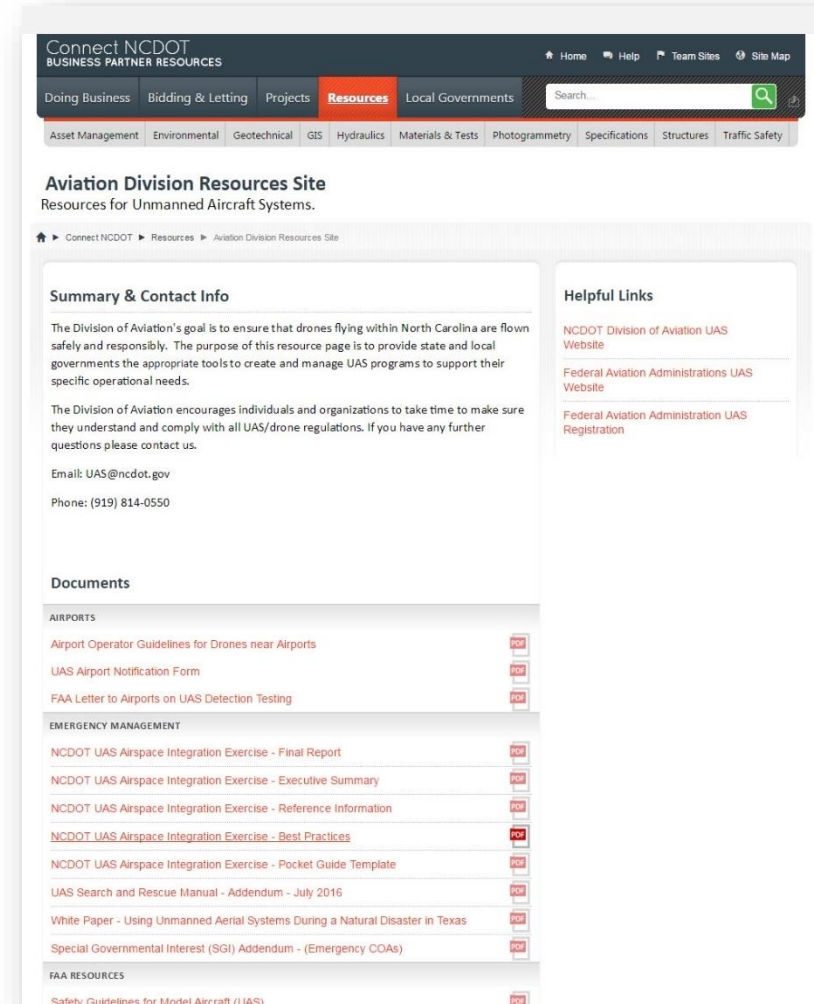
- Pass NC UAS Knowledge test online
- Apply for commercial or government NC Operator Permit online
- www.ncdot.gov/aviation/uas



NCDOT UAS Resource Page

Publicly available online:

- List of NC General Statutes
- Best Practices
- UAS Research Reports
- UAS Related Links
- FAA Resources
- Law Enforcement Resources
- Emergency Management Resources
- Airport Operator Resources
- <https://connect.ncdot.gov/resources/Pages/Aviation-Division-Resources.aspx>



NCDOT UAS Program Office

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